FCC 12-152

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Notice of Proposed Rulemaking	)	
18 FCC Rcd 13187, 13188 ¶1 (2003)	)	ET Docket No. 03-137
	)	
And	)	
	)	
Service Rules for the Advanced Wireless Services	)	WT Docket No. 12-357
H Block---Implementing Section 6401 of the	)	
Middle Class Tax Relief and Job Creation Act of	)	
2012 Related to the 1915-1920 MHz and	)	
1995-2000 MHz Bands ¶53 footnote 95	)	

And

Proposed Changes in the Commission's Rules	**)**	
Regarding Human Exposure to Radio frequency	**)**	
Electromagnetic Fields	**)**	**ET Docket No. 03-137**

To: Office of the Secretary
Federal Communications Commission
Washington, DC 20554

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DATE: August 14, 2013

AFFIDAVIT OF MARY REDMAYNE

Region of WELLINGTON, NEW ZEALAND

I, Mary Redmayne, PhD[1], attest that my statements are true to the best of my knowledge.

Comment round for ET Docket No. 03-137, WT Docket No. 12-357, and **ET Docket No. 03-137**.

My name is Mary Redmayne.
My address is 19 Moana Road, Kelburn, Wellington 6012, New Zealand.

2. I am currently **Adjunct Research Associate at Victoria University of Wellington, NZ; a Participating Member of Standards Australia Committee on Human Exposure to Electromagnetic Fields TE-007; on the Editorial Board of the Journal of Experimental and Clinical Medicine; Scientific Advisor to the Environmental Health Trust, USA.**

3. I have conducted epidemiological research assessing the effects of exposure to wireless phones on young people's wellbeing. My results indicated that use of either cellphone or wireless phone by 10 to 13 year-olds for more than 15 minutes daily is associated with frequent headaches, in some cases daily headaches (Redmayne et al., 2012).

4. Interviews with young people about how, and how long, they use cell phones indicated that the phones not infrequently became too hot for the ear (pinna) and hand for them to comfortably continue a call.

5. My research indicated that more than 40% of 10-13 year olds use their cellphones from within their trouser or skirt pocket at school during lessons. Texts are transmitted on full power. More than half the cellphone owners carried a switched-on phone in their pockets for more than 6 hours daily (Redmayne et al., 2011).

6. Forty six percent of participants aged 10-13 had already had six or more years' use of a cordless phone (which is a type of cellphone). Almost a third of participants reported spending 30 minutes or more on a cordless phone daily (Redmayne et al., 2012).

[1] Thesis in library. Awaiting December 2013 graduation

7. Approximately 90% of 373 10-13 year olds used a cellphone regularly; 76% owned one (Redmayne et al., 2012).

8. In a pooled analysis of brain tumour risk from wireless phone use, the highest odds ratio (OR) was in those who began wireless phone use before the age of 20 years and had >1 year's use (Hardell et al., 2006). The odds ratio of malignant tumour for this age group from cordless phone use was OR 2.1, 95% with a confidence interval (CI) of 0.97-4.6, while for digital cellphones it was OR 3.7, 95% CI 1.5-9.1.

9. In this Notice of Inquiry the FCC asks:

A. On page 4, Item 6, the Commission is seeking input on "whether additional precautions may be appropriate in some cases, for example with respect to children"

Yes, additional precautions are warranted for children. The SAM mannequin used for testing cellphones is modelled on a large male head. This is non-representative of a child's head where the absorption is greater and the energy penetrates comparatively deeper into the brain in a child's small head. Christ et al. have demonstrated that exposure to radiofrequencies in the brain from cellphone calls is higher in toddlers and children than adults (Christ et al., 2010). They found several "major age-dependent changes" (p.1780), ultimately due to the distance between the radiation source and the respective brain region. These included increased energy absorption (SAR) in young children of 2 dB to 5 dB in some brain regions, such as the hippocampus and hypothalamus; absorption in bone marrow 10-fold higher than in adults; and greater absorption in the eyes of children than adults.

It may be more appropriate to require that cell phones (especially those for use by young people) can only function for calls with headsets or with hands-free operation thereby avoiding any phone-to-ear use. This would also overcome the difficulty of, and need for, measuring SAR in the head.

B. P.5, Item 7, in the *Inquiry* asks whether the Commission should consistently require either disclosure of the maximum SAR or other more reliable exposure data in a standard format--perhaps in manuals, at point of sale, or on a website.

> Consumers should know what they are buying. Not only should the maximum SAR be listed, but also details of the circumstances under which the phone is likely to emit more or less microwave energy.
>
> Maximum SAR and the minimum distance at which it applies should also be clearly labeled on laptops, tablets, and any other electronic transmitting technology commonly used in the lap.

C. Page 17 states: "currently, the outer ear, or 'pinna' is not included on the list of exceptions from the localized SAR limits for "extremities" in the Commission's rules. Nor has the Commission treated the pinna as subject to localized SAR limits to the head, nor has it required parties seeking equipment authorizations to measure or calculate localized SAR in the pinna. This is because there is no standard for SAR measurement in the pinna."

> The pinna should clearly have the same limits as the head as it is part of the head, is adjacent to the brain, and is comprised of conducting tissue against which the transmitting device is held. The currently used SAM mannequin does not treat the pinna as anything other than space as it is a plastic spacer. This has been criticised for reducing conduction and thereby lowering the measured energy absorption in the brain (Gandhi and Kang, 2004; Gandhi et al., 2012).
>
> The Commission follows a standard which prescribes that the maximum SAR for any 1 gram of "body tissue (defined as tissue volume in the shape of a cube) be less than or equal to 1.6 W/kg. The Safety Standard (IEEE 1991) defines extremity tissues as "hands, wrists, feet and ankles" where a larger

SAR of 4 W/kg for any 10 g of tissues is permitted. Not only should the pinna have a limit of 1.6 W/kg, but the one used on the mannequin being used for testing should be part of the head and filled with the same fluid as that in the head for any test being carried out.

D. Page 18, Item 47, states, "*Decision.* We conclude that classification of the pinna as an extremity is supported by the expert determinations of the FDA and of the IEEE, will have no practical impact on the human exposure to RF radiation, and is therefore appropriate."

I strongly disagree. Both the FDA and the IEEE (2005) are ignoring the peer-reviewed published data by Gandhi et al (2004), which has shown that greatly increased cell phone radiation would be allowed if pinna (which is a conduit for cell phone radiation into the brain) is declared as an extremity tissue.

A major implication of re-classifying the pinna as extremity tissue is that it would mean that the permitted power density of cell phones could be increased considerably compared with being treated as 1 gram of body tissue or as part of the head.

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Respectfully submitted by

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